

5-6. Claims 1, 2, 5, 7-10 and 15-18 are now ~~believed~~ to be allowable under U.S.C. 101, having been amended to particularly point out and define utility of the invention including that which is inherent in the support column depicted in Figs. 5 and 6 of the specification drawings. The claims are no longer directed toward non-statutory subject matter.

7-8. The applicant's invention, as defined by the amended claims should no longer be rejected under 35 U.S.C. 102(b) on the basis of the reference article in Physics, 4th Edition, since this is a reference regarding non-statutory subject matter and one which does not disclose the applicant's invention. As the applicant has previously pointed out, the example of a ship in a canal which has sides closely spaced from the sides of the ship, is not an example of a conformal cavity. The Examiner has agreed to this in item 10 of the current action. The canal would need to furnish the ship with closely spaced walls on all sides in order for the combination to perform as the Physics author suggests it would, and to constitute an anticipation of the applicant's conformal cavity as shown in the ship and lock example depicted in Figs. 1 and 2 of the applicant's specification. As depicted and discussed in the Physics article, the ship would be subjected to conditions no different that it would in open water, having free and unrestricted access to canal water in both fore and aft directions. The author states "All that is needed, in principle, is a thin section of water that separates the hull of the floating ship from the sides of the canal". The article is misleading and confusing to anyone who might be trying to appreciate the fundamentals of the principle that permits a body to be buoyed up by an immersing liquid with a force that exceeds the weight of the liquid. In the example there is no isolation of the water and thus no restriction as to the quantity of water attributable to the support of the ship and thus nothing that should appear so very remarkable as the author claims. The weight of the water surrounding the ship, as shown and discussed, would have to include all of that in the canal and any connecting bodies of water. There is an apparent recognition by the author of the validity of the phenomenon disclosed and defined by the applicant, but the article fails to disclose any operable combination that anticipates those disclosed by the applicant.

The Physics author's dramatic exaggeration, that "This thin section of water could have a very small volume indeed and fit into a single glass!", ignores many limiting factors that exist, even in theory.

9. The Examiner's withdrawal of objections under 35 U.S.C. 112.2 in view of the applicant's amendment is duly noted and it is believed that any new objections under 35 U.S.C. 112.2 will be avoided by the present amendments.

10. The Examiner's agreement that the prior ship references "do not have fronts and backs nor are the conformal cavities" is noted. The Examiner will agree that the canal in the Examiner's reference from Physics, 4th Edition, also lacks a front and back, is not a conformal cavity, and does not anticipate the applicant's invention for the same reason.

11. The fact that the Examiner no longer disputes the validity of the applicant's buoyancy claims is noted. The applicant feels that the inadequacy of the generally accepted statements of buoyancy law have led to the Examiner's earlier contentions. He has made many active but vain attempts to have such statements revised so as to be more accurately representative and inclusive of all phenomena. Since it is now recognized that the applicant's invention violates no natural law, and no non-statutory laws of nature are now claimed which are apart from devices having utility, Claims 1-5, 7-10 and 15-18 are believed to be allowable.

Suite 1305

112 West Adams Street  
Jacksonville, Florida 32202-3853

Tel.No. (904) 355-9631

Fax.No. (904) 355-9632

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Respectfully submitted,

  
Arthur G. Yeager, Reg.No. 19,892



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CLAIMS (PREVIOUSLY AMENDED)  
MARKED-UP VERSION TO SHOW CHANGES

1. A device for providing buoyant support comprising a member defining a cavity and a body disposed within said cavity, said cavity being adapted to contain a liquid and to have walls that generally conform horizontally in their shaping to the shape of said body to be received in said cavity and immersed in the liquid, said cavity being of a size that causes said walls to be closely spaced to side surfaces of said body so that the contained liquid exerts an upward buoyant force on said immersed body that is greater than the weight of the liquid that said body displaces within said cavity, said walls of the said cavity extending vertically to a height at least equal to the height which [is] must be reached by the said liquid relative to said cavity to achieve a buoyant force when said body is immersed in said liquid within said cavity, said device further comprising means to limit the upward travel of said body in response to said buoyant force, so that an increase in the extent of immersion and a corresponding increase of buoyant force beyond that which equals the weight of the body, caused by the continued addition of liquid to said cavity, will not increase the elevation of said body and so that a subsequent increase in the weight of said body, caused by its support of a structure, will not decrease the elevation of said body until said increase in buoyant force has been exceeded by said increase in weight.

2. The device as defined in claim 1, in which a base of said cavity is also made to conform substantially to a base of said body or portion of said body to be immersed and made of a size that will permit said cavity to have a relatively close spacing to both said side surfaces and said base of said body so that a maximum buoyant force may be achieved with a least amount of the liquid.

5. A device for providing buoyancy support comprising a cavity formed in said device, said cavity being adapted to contain and confine a liquid, said cavity walls generally conforming in their shaping to shaping of a body to be received and immersed in a liquid disposable in said cavity, said cavity being of a size that confines space about [a] the body so that a liquid in said cavity rises rapidly about [a] the body, relative to its descent, and immerses [a] the body with displacement of a lesser weight of liquid whereby an upward buoyant force is exerted upon [an] the immersed body which is substantially equal to a greater weight of liquid that would be displaced by immersion of

the body to the same extent in a liquid under unconfined conditions, said walls of said cavity extending upwards to a height that is at least equal to that which would be reached by the said liquid, relative to said cavity, when said [a] body is immersed in said liquid within said cavity under said unconfined conditions, said device also comprising means to limit the upward travel of said body in response to said buoyant force, so that an increase in the extent of immersion and a corresponding increase of buoyant force beyond that which equals the weight of the body, caused by the continued addition of liquid to said cavity, will not increase the elevation of said body and so that a subsequent increase in the weight of said body, caused by its support of a structure, will not decrease the elevation of said body until said increase in buoyant force has been exceeded by said increase in weight.

7. The device as defined in claim 5, wherein said cavity and [a] the body are made with vertical walls having extended spans of lateral dimensional uniformity to permit a substantially uniform horizontal spacing that is maintained with differing levels of body immersion.

8. The device as defined in claim 5, in which said cavity and [a] the body are made to include non-vertical walls that cause walls of [a] the body to move closer to said walls of said cavity when [a] the body descends into said cavity so that the rate of increase in buoyancy relative to descent will be made to increase by increasing the rate of immersion.

9. The device as defined in claim 1, wherein [a] the body, to which said cavity has walls that generally conform horizontally in their shaping, has a preexisting shape.

10. The device as defined in claim 5, in which [a] the body, to which said cavity walls are generally conforming in their shaping, has a preexisting shape.

15. A combination to generate buoyant force, and to demonstrate the principles of its generation for educational purposes, said combination comprising a liquid, a body capable of floating in said [a] liquid and a member defining a cavity, said cavity being adapted to contain both said liquid and said body, said cavity having walls that closely conform to [a] the shape of said body and which are closely spaced from said body when said body is placed in said cavity, said combination causing the body to displace a volume of

liquid within said cavity that is less than an immersed volume of said body whereby a buoyant force is exerted on said body that exceeds the weight of said volume of liquid, said walls rising vertically to at least a height that [at least equals the height reached by the said] is required to retain said volume of liquid displaced by said body when said body is immersed in said liquid within said cavity, the said body and cavity combination being made to make the level of said liquid observable when said body is immersed in said liquid in said cavity, said body being made to float with the majority of its weight within its said immersed volume.

17. The combination as defined in claim 15, wherein said cavity walls, that closely conform to said shape of said body and which are closely spaced from said body when said body is placed in said cavity, [has] have a shape that is preexistent.